

CLAIMS

The invention claimed is:

1. An orthodontic bracket for use with a wire to reposition a tooth, comprising:  
a body defining a coextensive opening for receiving the wire, wherein the body does not have a base with a surface area for bonding directly to the tooth and fixing the position of the opening, wherein the bracket is positionable at an angle relative to the tooth surface without any part of the body creating a lever arm against the tooth surface.
2. The orthodontic bracket of Claim 1, wherein the body comprises a gingival sidewall, an occlusal sidewall, and a lingual sidewall therebetween that cooperatively define the opening so that the opening is open on a tooth side.
3. The orthodontic bracket of Claim 2, wherein the body has a low profile width that is equal to a depth of the opening plus a thickness of the lingual sidewall.
4. The orthodontic bracket of Claim 2, wherein the bracket is positionable offset from the tooth or adjacent to the tooth, wherein when the bracket is offset from the tooth then no part of the bracket contacts the tooth, and when the bracket is adjacent to the tooth then the gingival sidewall, the occlusal sidewall, or both contact the tooth.
5. The orthodontic bracket of Claim 2, wherein the opening is rectangular and the bracket is positionable adjacent to or offset from a vertical or a non-vertical surface of the tooth with the rectangular opening still level.
6. The orthodontic bracket of Claim 5, wherein the gingival sidewall has a length that is greater than a length of the occlusal sidewall so that the open tooth side is angled from vertical.

7. The orthodontic bracket of Claim 1, wherein the body comprises one or more retention wings extending therefrom.
8. The orthodontic bracket of Claim 7, wherein the body has a low profile width that is equal to a depth of the opening plus a thickness of the lingual sidewall plus a horizontal extension of the wings.
9. The orthodontic bracket of Claim 7, wherein the opening is rectangular and the wings are angled relative to the rectangular opening so that the bracket is positionable adjacent to or offset from a vertical or a non-vertical surface of the tooth with the rectangular opening still level.
10. The orthodontic bracket of Claim 9, wherein the wings are curved away from the tooth as they extend away from the opening so that if the wings were extended across the opening they would form a continuous convex surface.
11. The orthodontic bracket of Claim 10, wherein one of the wings extends from a gingival sidewall of the body and is curved back as the wing extends away from the opening, and another of the wings extends from an occlusal sidewall of the body and is curved back as the wing extends away from the opening.
12. The orthodontic bracket of Claim 10, wherein one of the wings extends from a gingival sidewall of the body and is curved back as the wing extends away from the opening, and another of the wings extends from an occlusal sidewall of the body and is curved forward as the wing extends away from the opening.
13. The orthodontic bracket of Claim 1, wherein the body defines notches arranged for enhanced bonding strength.
14. The orthodontic bracket of Claim 1, wherein at least a portion of the body and the opening are curved laterally.

15. The orthodontic bracket of Claim 1, wherein the body defines two or more of the openings.
16. The orthodontic bracket of Claim 1, wherein the opening is tubular with open
17. An orthodontic attachment comprising a mass of adhesive bonded to the tooth and the bracket of Claim 1 embedded in the adhesive mass.
18. The orthodontic attachment of Claim 17, wherein the adhesive mass encapsulates the bracket except for the opening.
19. The orthodontic attachment of Claim 17, wherein the adhesive mass and the bracket are attached to a lingual surface of the tooth.
20. An orthodontic appliance attached to a plurality of teeth, the appliance comprising a plurality of the attachments of Claim 17, wherein at least one of the attachments is attached to a lingual surface of a front one of the teeth.
21. The orthodontic appliance of Claim 20, wherein at least one other of the attachments is attached to a facial surface of a back one of the teeth.
22. An orthodontic kit comprising at least one of the brackets of Claim 1 and at least one clip configured to hold the bracket during attachment.
23. The orthodontic kit of Claim 22, wherein the clip comprises a finger that is receivable in the bracket opening and a handle portion for grasping.
24. A clip for holding an orthodontic bracket having an opening, the clip comprising:
  - a finger that is receivable in the bracket opening; and
  - a handle portion for grasping.

25. The clip of Claim 24, wherein the finger has a cross sectional shape that conforms to a cross sectional shape of the bracket opening.
26. The clip of Claim 24, wherein the finger is configured so that it is receivable in the bracket opening with a snug fit so that the clip can be held by the handle portion and the clip will support the bracket.
27. The clip of Claim 24, wherein the finger has a length that is greater than a length of the bracket opening so that the finger is extendable all the way through the opening to prevent an adhesive from intruding into the opening.
28. The clip of Claim 24, wherein the finger is curved.
29. The clip of Claim 24, wherein the handle portion is keyed for use with a keyed positioning tool or device, wherein the clip is consistently alignable when grasped by the positioning tool or device.
30. An orthodontic attachment for use with a wire to reposition a tooth, comprising:
  - a mass of adhesive bonded to the tooth; and
  - an orthodontic bracket comprising a body at least partially defining an opening for receiving the wire, wherein the bracket is embedded in the adhesive mass.
31. The orthodontic attachment of Claim 30, wherein the adhesive mass encapsulates the bracket except for the opening.
32. The orthodontic attachment of Claim 30, wherein the opening is a closed tube with at least one sidewall defined by the adhesive mass.
33. The orthodontic attachment of Claim 30, wherein the adhesive mass and the bracket are attached to a lingual surface of the tooth.

34. An orthodontic appliance attached to a plurality of teeth, the appliance comprising a plurality of the attachments of Claim 30, wherein at least one of the attachments is attached to a lingual surface of a front one of the teeth.
35. The orthodontic appliance of Claim 34, wherein at least one other of the attachments is attached to a facial surface of a back one of the teeth
36. A method of attaching orthodontic brackets to teeth, comprising:
  - creating a model of the teeth;
  - providing a plurality of orthodontic brackets each having an opening for receiving a wire;
  - positioning the brackets relative to the model teeth;
  - occluding the bracket openings;
  - bonding the brackets to the model teeth with an adhesive;
  - applying an impression material to the model teeth and the brackets;
  - removing the impression material and the brackets from the model teeth with the brackets held in position by the impression material;
  - positioning the impression material and the brackets on the teeth;
  - bonding the brackets to the teeth with an adhesive;
  - removing the impression material from the teeth; and
  - unoccluding the bracket opening,

wherein upon completion of the method, the adhesive is bonded to the teeth and the brackets are embedded in the adhesive with the openings unobstructed.
37. The method of Claim 36, wherein the step of providing a plurality of brackets comprises providing brackets each comprising three sidewalls and an open side defining the opening, without a base with a surface area for bonding directly to the corresponding tooth, wherein the brackets are positionable at an angle relative to the corresponding tooth surface without any part of the bracket creating a lever arm against the tooth surface, the bracket has a low profile width, and the bracket is positionable offset from the tooth or adjacent to the tooth.

38. The method of Claim 36, wherein the step of positioning the brackets comprises, for each of the brackets, providing a clip for holding the bracket and moving the clip until the bracket is positioned.
39. The method of Claim 38, wherein, for each of the brackets, the step of occluding the bracket opening comprises inserting a finger of the clip into the bracket opening, and the step of unoccluding the bracket opening comprises removing the finger from the bracket opening.
40. The method of Claim 38, wherein the step of positioning the brackets further comprises, for each of the brackets, grasping a handle portion of the clip by a positioning tool or device.
41. The method of Claim 36, wherein the step of positioning the brackets comprises, for each of the brackets, suspending the bracket offset from or adjacent to the corresponding tooth.
42. The method of Claim 36, wherein the step of positioning the brackets comprises, for at least one of the brackets, base-independently positioning and orienting the bracket relative to the corresponding tooth so that the bracket opening orientation is not fixed but instead is customized to the corresponding tooth for coordination with adjacent bracket openings to form a smooth and continuous arch-shaped wire pathway upon completion of the orthodontic treatment.
43. The method of Claim 36, wherein the step of positioning the brackets comprises, for at least one of the brackets, positioning the bracket offset from the corresponding tooth so that the bracket is suspended in the adhesive and does not contact the tooth.

44. The method of Claim 36, wherein the step of positioning the brackets comprises positioning at least one of the brackets at a lingual surface of a front one of the teeth.
45. The method of Claim 44, wherein the step of positioning the brackets further comprises positioning at least one other of the brackets at a facial surface of a back one of the teeth.
46. The method of Claim 45, wherein the step of positioning the brackets further comprises positioning the facial surface brackets and the lingual surface brackets in an overlapping arrangement.
47. The method of Claim 45, further comprising the step of removing the facial surface brackets while leaving intact the lingual surface brackets for use as a retainer.
48. The method of Claim 36, wherein:
  - the step of bonding the brackets to the model teeth comprises encapsulating each of the brackets; and
  - the step of applying an impression material to the model teeth and the brackets comprises forming an impression in the impression material of the bracket encapsulation,
  - wherein upon completion of the method, the brackets are encapsulated by the adhesive with the openings unobstructed.
49. The method of Claim 48, wherein the step of encapsulating each of the brackets comprises covering the brackets with the adhesive.
50. The method of Claim 49, wherein the step of encapsulating each of the brackets further comprises providing the adhesive in a color generally conforming to the natural color of the teeth.

51. The method of Claim 48, wherein the step of encapsulating each of the brackets comprises covering each of the brackets with a corresponding shell.
52. The method of Claim 51, further comprising:  
removing the shells from the brackets and from the impression material; and  
filling the bracket-encapsulating impression in the impression material with the adhesive.